



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : F02M 61/16, B23K 26/00	A1	(11) International Publication Number: WO 00/09884 (43) International Publication Date: 24 February 2000 (24.02.00)
(21) International Application Number: PCT/US99/16313 (22) International Filing Date: 19 July 1999 (19.07.99) (30) Priority Data: 09/132,420 11 August 1998 (11.08.98) US (71) Applicant: CATERPILLAR INC. [US/US]; 100 N.E. Adams Street, Peoria, IL 61629-6490 (US). (72) Inventor: DURHEIM, Brent, A.; 1313 W. Sunnyview Drive, Peoria, IL 61614 (US). (74) Agents: BRAM, Eric, M. et al.; 100 N.E. Adams Street, Peoria, IL 61629-6490 (US).		(81) Designated States: JP, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i>

(54) Title: LASER DRILLED NOZZLE IN A TIP OF A FUEL INJECTOR

(57) Abstract

A fuel injector housing (34) having a main body portion (36) and a tip portion (38) is disclosed. The nozzle (44) defined in the tip portion (38) has a passageway (46) extending therethrough which is in fluid communication with the chamber (42). The nozzle (44) is prepared by a process including the step of focusing a laser beam (17D), so that its focal point (30) is located substantially on an outer surface (31) of the tip portion (38) for a first period of time sufficient to create the passageway (46) and a waste product (50) is deposited at a periphery of the passageway (46). The process further includes the step of creating a first prepassageway (60) which extends through the tip portion (38) of the housing (34), defining a first substantially cylindrically-shaped channel having a first diameter. Then a second prepassageway (62) is created which extends through the tip portion (38) of the housing (34), defining a second substantially cylindrically-shaped channel having a second diameter which is greater than the first diameter. The process yet further includes the step of refocusing the laser beam (17D) so that its focal point (30) is located above the outer surface (31) for a second period of time sufficient to disintegrate the waste product (50).

